

WHAT IS CLAIMED IS:

1. A purified immunogenic polypeptide, the amino acid sequence of which comprises at least eight consecutive residues of a sequence selected from the group consisting of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20.
- 5 2. The immunogenic polypeptide of claim 1, the amino acid sequence of which comprises at least 12 consecutive residues of a sequence selected from the group consisting of SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20.
3. A composition comprising the immunogenic polypeptide of claim 1.
4. A mutant of the immunogenic polypeptide of claim 1, wherein said mutant
10 polypeptide retains immunogenicity.
5. A composition comprising the mutant polypeptide of claim 4.
6. A method of eliciting an immune response in an animal, said method comprising introducing the composition of claim 3 into said animal.
7. The method of claim 6, wherein said composition is administered orally,
15 intranasally, intraperitoneally, intramuscularly, subcutaneously, or intravenously.
8. The method of claim 6, wherein said animal is a swine.
9. An isolated nucleic acid comprising a nucleotide sequence that encodes an immunogenic polypeptide, the amino acid sequence of which comprises at least eight consecutive residues of a sequence selected from the group consisting of SEQ ID NOs: 2,
20 4, 6, 8, 10, 12, 14, 16, 18, and 20.
10. The nucleic acid of claim 9, wherein said nucleotide sequence is selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, and 19.
11. A vector comprising the nucleic acid of claim 9.
12. A host cell comprising the vector of claim 11.
- 25 13. A mutant of the nucleic acid of claim 9.
14. A vector comprising the mutant nucleic acid of claim 13.
15. A host cell comprising the vector of claim 14.
16. The vector of claim 11, wherein said nucleic acid is operably linked to an expression control sequence.
- 30 17. A host cell comprising the vector of claim 16.

18. A composition comprising the vector of claim 16 and a pharmaceutically acceptable carrier.

19. A method of eliciting an immune response in an animal, said method comprising introducing the composition of claim 18 into said animal.

5 20. A method of determining whether or not an animal has an antibody reactive to the immunogenic polypeptide of claim 1, said method comprising:

providing a test sample from said animal;

contacting said test sample with said immunogenic polypeptide under conditions permissible for specific binding of said immunogenic polypeptide with said
10 antibody; and

detecting the presence or absence of said specific binding, wherein said presence of specific binding indicates that said animal has said antibody, and wherein said absence of specific binding indicates that said animal does not have said antibody.

21. The method of claim 20, wherein said test sample is a biological fluid.

15 22. The method of claim 21, wherein said biological fluid is selected from the group consisting of blood, nasal fluid, throat fluid, and lung fluid.

23. The method of claim 20, wherein said immunogenic polypeptide is attached to a solid support.

24. The method of claim 23, wherein said solid support is a microtiter plate, or
20 polystyrene beads.

25. The method of claim 20, wherein said immunogenic polypeptide is labeled.

26. The method of claim 20, wherein said detecting is by radioimmunoassay (RIA), enzyme immunoassay (EIA), or enzyme-linked immunosorbent assay (ELISA).

25 27. A diagnostic kit for detecting the presence of an antibody in a test sample, wherein said antibody is reactive to the immunogenic polypeptide of claim 1, said kit comprising the immunogenic polypeptide of claim 1.